

In reply, Applicants will file formal drawings when the application is allowed as stated on Page 2 of the Office Action dated November 7, 2003.

In response to the rejection under the judicially created doctrine of double patenting, submitted herewith is a Terminal Disclaimer which obviates the double patenting rejection. Accordingly, the double patenting rejection should be withdrawn.

Briefly recapitulating, Claim 1 is directed to an optical waveguide. For example, referring to the non-limiting embodiment of Figs. 1A, 1B and 2, an optical waveguide includes a single mode waveguide 12 and a multi-mode waveguide 5 which is configured to realize multi-mode and connected to the single mode waveguide 12. The multi-mode waveguide 5 is a multi-mode **broadening** waveguide having a **width which increases toward a direction of light propagation**. Accordingly, the multi-mode waveguide 5 can broaden a multi-mode area, and so the base portions a1 and a2 as shown in Fig. 28 can be suppressed.

Claim 16 is directed to an arrayed waveguide grating optical multiplexer/demultiplexer. For example, referring to the non-limiting embodiment of Figs. 1A, 1B and 2, an arrayed waveguide grating optical multiplexer/demultiplexer includes a single mode waveguide 12 and a multi-mode waveguide 5 for propagating a multi-mode optical signal connected to the single mode waveguide 12. The multi-mode waveguide includes a multi-mode **broadening** waveguide having a **width increasing in a direction of an arrayed waveguide**. Accordingly, the multi-mode waveguide 5 can broaden a multi-mode area, and so the base portions a1 and a2 as shown in Fig. 28 can be suppressed.

The Office Action asserts that Amersfoort et al. disclose, in Fig. 13, a multi-mode waveguide. However, Amersfoort et al. fail to disclose a multi-mode broadening waveguide having a width which increases toward a direction of light propagation or in a direction of an arrayed waveguide. Instead, Amersfoort et al. disclose a multi-mode waveguide which has a

constant width. The Amersfoort et al. multi-mode waveguide which has a constant width cannot broaden a multi-mode area, and so the base portions a1 and a2 cannot be suppressed as shown in Fig. 28.

Accordingly, Amersfoort et al. are not believed in any way to anticipate the specific features recited in Claims 1 and 16. Therefore, Claims 1 and 16 are believed to be allowable.

Substantially the same arguments as set forth above with regard to Claim 1 also apply to dependent Claims 2-5, which depend directly or indirectly from Claim 1. Accordingly, each of the dependent claims is also believed to be allowable.

Claim 17 is directed to an arrayed waveguide grating optical multiplexer/demultiplexer. For example, referring to the non-limiting embodiment of Figs. 1A, 1B and 2, an arrayed waveguide grating optical multiplexer/demultiplexer includes at least one multi-mode waveguide for realizing multi-mode includes a multi-mode **broadening** waveguide.

The Office Action asserts that Amersfoort et al. disclose, in Fig. 13, a multi-mode waveguide. However, Amersfoort et al. fail to disclose a multi-mode broadening waveguide. The Amersfoort et al. multi-mode waveguide which has a constant width cannot broaden a multi-mode area, and so the base portions a1 and a2 cannot be suppressed as shown in Fig. 28.

Accordingly, Amersfoort et al. are not believed in any way to anticipate the specific features recited in Claim 17. Therefore, Claim 17 is believed to be allowable.

Claim 43 is directed to a multi-mode waveguide. For example, referring to the non-limiting embodiment of Fig. 2, a multi-mode waveguide 5 includes a first end portion 4 and a second end portion 6 having a second width larger than a first width of the first end portion 4. The first end portion 4 is configured to be connected to a first optical waveguide 12. The second end portion 6 is configured to be connected to a first slab waveguide 13. **A width of**

the multi-mode waveguide 5 increases from the first end portion 4 toward the second end portion 6 and is configured to realize multi-mode.

Claim 45 is directed to an optical waveguide circuit. For example, referring to the non-limiting embodiment of Fig. 2, an optical waveguide circuit includes a multi-mode waveguide 5 that has a first end portion 4 and a second end portion 6 having a second width larger than a first width of the first end portion 4. The first end portion 4 is configured to be connected to a first optical waveguide 12. The second end portion 6 is configured to be connected to a first slab waveguide 13. **A width of the multi-mode waveguide 5 increases from the first end portion 4 toward the second end portion 6** and is configured to realize multi-mode.

The Office Action asserts that Amersfoort et al. disclose, in Fig. 13, a multi-mode waveguide. However, Amersfoort et al. fail to disclose a multi-mode waveguide whose **width increases from the first end portion toward the second end portion.** Instead, Amersfoort et al. disclose a multi-mode waveguide which has a constant width. The Amersfoort et al. multi-mode waveguide which has a constant width cannot broaden a multi-mode area, and so the base portions a1 and a2 cannot be suppressed as shown in Fig. 28.

Accordingly, Amersfoort et al. are not believed in any way to anticipate the specific features recited in Claims 43 and 44. Therefore, Claims 43 and 44 are believed to be allowable.

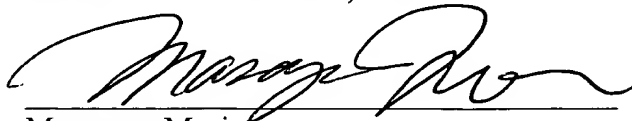
Substantially the same arguments as set forth above with regard to Claim 44 also apply to dependent Claim 45, which depend directly from Claim 44. Accordingly, dependent Claim 45 is also believed to be allowable.

Application No. 09/741,824
Reply to Office Action of November 7, 2003

Consequently, in view of the above discussion, it is respectfully submitted that this application is in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Masayasu Mori
Attorney of Record
Registration No. 47,301

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)

MM:jm
I:\USER\MSMOR\FURUKAWA\198334AME3.DOC